

CLAIMS

What is claimed is:

1. A composition of matter comprising a polyurethane elastomer prepared by mixing

A) a polyurethane prepolymer,

B) a curative, and

C) a liquid, non-reactive polydimethylsiloxane,

wherein C) is present in a concentration of about 0.5 to about 25 % based on the combined weight of A) plus B),

and curing the mixture to form the elastomer.

2. The composition of claim 1 wherein the polyurethane prepolymer is prepared from a

diisocyanate selected from the group consisting of paraphenylene diisocyanate, tolidene diisocyanate, isophorone diisocyanate, 4,4'-methylene bis (phenylisocyanate), toluene-2,4-diisocyanate, toluene-2,6-diisocyanate, naphthalene-1,5-diisocyanate, diphenyl-4,4'-diisocyanate, dibenzyl-4,4'-diisocyanate, stilbene-4,4'-diisocyanate, benzophenone-4,4'-diisocyanate, 1,3- and 1,4-xylene diisocyanates, 1,6-hexamethylene diisocyanate, 1,3-cyclohexyl diisocyanate, 1,4-cyclohexyl diisocyanate, the three geometric isomers of 1,1'-methylene-bis(4-isocyanatocyclohexane), and mixtures of the foregoing.

3. The composition of claim 2 wherein the diisocyanate is reacted with a polyol selected from the group consisting of polyether polyols, polyester polyols, and hydrocarbon polyols, having a number average molecular weight of at least 250.

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1 4. The composition of claim 3 wherein the polyol is a polyalkyleneether polyol
2 represented by the general formula $\text{HO}(\text{RO})_n\text{H}$, wherein R is an alkylene radical and n is an
3 integer large enough that the polyether polyol has a number average molecular weight of at
4 least 250.

1 5. The composition of claim 1 wherein the curative is selected from the group consisting
2 of diamines, polyols, and blends thereof having a melting point below 140°C .

1 6. The composition of claim 5 wherein the curative is selected from the group consisting
2 of 1,4-butanediol, hydroquinone-bis-hydroxyethyl ether, 1,4-cyclohexane dimethanol,
3 trimethylolpropane, aliphatic tetrols, 4,4'-methylenedianiline, 2,2',5-trichloro-4,4'-
4 methylenediamines, naphthalene-1,5-diamine, ortho, meta, and para-phenylene diamines,
5 toluene-2,4-diamine, dichlorobenzidine, diphenylether-4,4'-diamine, 4,4'-methylene-bis(3-
6 chloroaniline), 4,4'-methylene-bis(3-chloro-2,6-diethylaniline), diethyl toluene diamine, tertiary
7 butyl toluene diamine, dimethylthio-toluene diamine, trimethylene glycol di-p-amino-benzoate,
8 1,2-bis(2-aminophenylthio)ethane, and methylenedianiline-sodium chloride complex, including
9 the derivatives and mixtures of the foregoing.

1 7. A method for producing a polyurethane elastomer comprising the steps of:

2 A) mixing:

3 1) a polyurethane prepolymer,

4 2) a curative, in sufficient amount to cure the polyurethane prepolymer,

5 and

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6 3) a non-reactive, liquid polydimethylsiloxane,
7 wherein 3) is present in a concentration of from about 0.5% to about 25% based on
8 the weight of 1) plus 2), and

9 B) curing the polyurethane prepolymer.

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1 8. The method of claim 7 wherein the polyurethane prepolymer is prepared from a
2 diisocyanate selected from the group consisting of paraphenylene diisocyanate, tolidene
3 diisocyanate, isophorone diisocyanate, 4,4'-methylene bis (phenylisocyanate), toluene-2,4-
4 diisocyanate, toluene-2,6-diisocyanate, naphthalene-1,5-diisocyanate, diphenyl-4,4'-
5 diisocyanate, dibenzyl-4,4'-diisocyanate, stilbene-4,4'-diisocyanate, benzophenone-4,4'-
6 diisocyanate, 1,3- and 1,4-xylene diisocyanates, 1,6-hexamethylene diisocyanate, 1,3-
7 cyclohexyl diisocyanate, 1,4-cyclohexyl diisocyanate, the three geometric isomers of 1,1'-
8 methylene-bis(4-isocyanatocyclohexane), and mixtures of the foregoing.

1 9. The method of claim 8 wherein the diisocyanate is reacted with a polyol selected from
2 the group consisting of polyether polyols, polyester polyols, and hydrocarbon polyols, having
3 a number average molecular weight of at least 250.

1 10. The method of claim 9 wherein the polyol is a polyalkyleneether polyol represented by
2 the general formula $\text{HO}(\text{RO})_n\text{H}$, wherein R is an alkylene radical and n is an integer large
3 enough that the polyether polyol has a number average molecular weight of at least 250.

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1 11. The method of claim 7 wherein the curative is selected from the group consisting of
2 diamines, polyols, and blends thereof having a melting point below 140° C.

1 12. The method of claim 11 wherein the curative is selected from the group consisting of
2 1,4-butanediol, hydroquinone-bis-hydroxyethyl ether, 1,4-cyclohexane dimethanol,
3 trimethylolpropane, aliphatic tetrols, 4,4'-methylenedianiline, 2,2',5-trichloro-4,4'-
4 methylenediamines, naphthalene-1,5-diamine, ortho, meta, and para-phenylene diamines,
5 toluene-2,4-diamine, dichlorobenzidine, diphenylether-4,4'-diamine, 4,4'-methylene-bis(3-
6 chloroaniline), 4,4'-methylene-bis(3-chloro-2,6-diethylaniline), diethyl toluene diamine, tertiary
7 butyl toluene diamine, dimethylthio-toluene diamine, trimethylene glycol di-p-amino-benzoate,
8 1,2-bis(2-aminophenylthio)ethane, and methylenedianiline-sodium chloride complex, including
9 the derivatives and mixtures of the foregoing.

1 13. An article of manufacture comprising a polyurethane elastomer and about 0.5% to
2 about 25% based on the weight of the elastomer of a non-reactive, liquid
3 polydimethylsiloxane, whereby the abrasion resistance of the article is improved with no
4 significant loss in friction.

1 14. The article of manufacture of claim 13 wherein the article is a railroad side bearing
2 pad.

1 15. The article of manufacture of claim 13 wherein the article is a skate wheel.

0069-UP

1 16. The article of manufacture of claim 13 wherein the article is a tire.

1 17. The article of manufacture of claim 13 wherein the article is a track pad.

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2 18. The article of manufacture of claim 13 wherein the article is an elastomeric friction
brake.

1 19. The article of manufacture of claim 13 wherein the article is a scraper blade.